DEFENCE R&D DÉFENSE

Colloque S&T Symposium 2007

Understanding The Human Dimension in 21st Century Conflict/Warfare - Comprendre la dimension humaine du conflit et de la conduite de la guerre au XXIe siècle

Robert N. Webb
Office of Chief Scientist

Canadä

Colloque S&T Symposium 2007

Understanding The Human Dimension in 21st Century Conflict/Warfare - Comprendre la dimension humaine du conflit et de la conduite de la guerre au XXIe siècle

Robert N. Webb
Office of Chief Scientist

Defence R&D Canada – Corporate

Technical Report
DRDC Corporate TR 2007-004
August 2007

Principal Author

Original signed by Robert N. Webb

Robert N. Webb

Head of International S&T and Technology Outlook Strategy

Approved by

Original signed by Camille Boulet

Camille Boulet

Chief Scientist, Corporate

Approved for release by

Original signed by Camille Boulet

Camille Boulet

Chief Scientist, Corporate

Abstract

In a world replete with natural disasters, regional conflicts, and geopolitical tensions, modern militaries are tasked to carry out a range of missions that require a broad array of skills. Many of these skills are devoted to mastering technological systems; however, even the most sophisticated technologies must, in the end, serve simple or complex human purposes. Militaries, after all, are made up of ordinary individuals -- individuals with varying strengths and weaknesses, wants and desires, stamina and frailties -- who must deal with extraordinary circumstances. During their careers, military personnel behold the tragic extremes of the human conditions: famine, war, death, destruction, and disease. And witnessing such calamities induces feelings of anger, fear, fatigue, and despair. Yet through it all, they are expected to perform. They are expected to carry out the mission. Ultimately, it is this human dimension of conflict, not technological prowess that determines success or failure in operations.

Understanding the human dimension in conflict, however, is complex -- where the word 'complex' is meant in its scientific usage, not its common one. It is complex because humans are the product of many interacting non-linear systems that give rise to many interacting non-linear behaviours. For instance humans perform activities where they serve both as observer and the observed; they engage in self-reflective behaviour that can change their capacity to be self-reflective; they can treat and behave towards others in ways they may, or may not, wish to be treated themselves. Indeed, the individual human organism exhibits many of the characteristics that science has identified with complex systems: such as sensitivity to initial conditions, hysteresis, self-similarity and unpredictability. Furthermore, when groups or societies of humans interact, the 'complexity' they display can reach staggering proportions, demonstrating the pinnacles of human accomplishment or the depths of human depravity.

A nation's military is its most potent means for dealing with extreme human conflict. Be it all out war, conducting security operations, or providing humanitarian relief, militaries embody a nation's most concentrated capability to respond quickly and decisively. Yet the scope and complexity of modern social conflicts can exceed even a military's considerable resources. More and more often, solutions to complex human conflict require complex solutions – solutions involving diverse organizations such as police forces, first responders, other government departments, non-government organizations (NGO/charities) and militaries. As a result, the politics of these operations can be Byzantine, the logistics overwhelming, and the moral and ethical considerations dizzying in their implications.

The purpose of this year's S&T Symposium 2007, as well as that of the symposia planned for the subsequent 2 years, is to explore the complexity of human conflict, in all of its vagaries. In order to better structure the effort, the Symposium will be organized along three themes that derive from the classifications of human conflict found in drama. Drama, after all, deals almost exclusively with human conflict, as many great historical works of fiction attest: Tolstoy's *"War and Peace",* Hemingway's *"The Old Man and the Sea"*, Shakespeare's *"Hamlet"*, and Hugo's *"Les Misérables."* Drama theory distinguishes three classes of human conflict -- person-versus-person, person-versus-nature, and person-versus-self -- and militaries inevitably deal with all three. It is these classes of conflict that will inform how we address our future security environment.

Person-versus-Person Conflicts:

In drama theory, person-versus-person conflicts go beyond individual one-on-one conflicts. They include also societal and cultural conflicts, since societies and cultures are, in the end, made up of individual persons. Therefore, a significant portion of any nation's energy and resources; be they police forces, the judiciary or the military, go towards resolving or preventing person-versus-person conflicts. Person-versus-person conflicts are arguably the most frequent cause of social instability and in many ways constitute the *raison d'être* for these organizations. With the collapse of the Cold War, increasing globalization and financial interdependencies, new social values (and intolerances), as well as evolving political and religious ideologies, the person-versus-person aspects of the future security environment need to be explored.

Person-versus-Nature Conflicts:

Person-versus-Nature conflicts encompass not only all instances in which humans are threatened by natural disasters, but also all human attempts to control Nature through clever inventions, through the application of science, or even through sheer physical prowess. In many countries, the military embodies the nation's broadest capability for facing Nature's challenges. Militaries are routinely required to perform in extremes of heat and cold, from the stratosphere to the ocean's depth, while carrying both the means for their own survival and the means for imposing their Will. In many ways, those militaries that best control (or account for) Nature have an advantage when it comes to achieving operational success.

Person-versus-Self Conflicts:

Person-versus-self conflicts arise inevitably from the first two types of human conflict, and militaries (as well as first responders) are particularly susceptible to them. For example, military personnel experience society's worst and most disturbing person-versus-person conflicts (e.g., extreme violence, war, genocide). And in providing aid to civil powers during earthquakes, floods, and famines, military personnel also face many of the most severe person-versus-Nature conflicts. No other organization exposes its members to a more varied and more extensive array of human adversity. As a result, no single group of individuals has more occasion to experience profound person-versus-self conflicts. Indeed, under such circumstances it would be unnatural if average military members did not suffer from such conflicts. How could they (or the society's in which they live) not question their morals, their cultural values, even their humanity? And how does such questioning affect performance, both of the individual and of the organization?

Our future security environment is, in the end, our future human environment. Being prepared to deal with this challenge, means being prepared to study ourselves.

Résumé

Dans un monde où abondent les catastrophes naturelles, les conflits régionaux et les tensions géopolitiques, les forces armées modernes se voient confier toute une gamme de missions nécessitant un large éventail de compétences. Bon nombre de ces dernières se rapportent à la maîtrise de systèmes technologiques; toutefois, mêmes les technologies les plus perfectionnées doivent, en bout de ligne, servir des fins humaines simples ou complexes. Après tout, les forces armées sont composées de personnes ordinaires – des personnes ayant divers points forts et points faibles, des souhaits et des désirs, de l'endurance mais aussi de la fragilité – qui doivent composer avec des circonstances extraordinaires. Pendant leur carrière, les militaires sont témoins des tragiques extrêmes de la condition humaine : la famine, la guerre, la mort, la destruction et la maladie. Le fait de voir de ses yeux de telles calamités suscite la colère, la peur, l'épuisement et le désespoir. Pourtant, on attend d'eux qu'ils fassent leur devoir et qu'ils remplissent leur mission. En fin de compte, c'est de cette dimension humaine du conflit, et non des merveilles de la technologie, que dépend la réussite ou l'échec des opérations.

Cependant, comprendre la dimension humaine des conflits est une tâche complexe (le mot « complexe » étant employé ici dans son sens scientifique et non courant). C'est une tâche complexe parce que les humains sont le résultat de nombreux systèmes non linéaires interdépendants, qui engendrent bien des comportements non linéaires interdépendants. Par exemple, les humains mènent des activités où ils sont à la fois observateurs et observés; ils adoptent un comportement autoréflectif qui peut modifier leur capacité d'être autoréflectifs; ils peuvent traiter les autres et agir envers eux d'une façon dont ils ne voudraient nécessairement pas être traités eux-mêmes. En fait, chaque organisme humain affiche bon nombre de caractéristiques que la science a étroitement associées à celles des systèmes complexes : par exemple, la sensibilité aux conditions initiales, l'hystérésis, l'autosimilarité et l'imprévisibilité. En outre, quand les sociétés ou des groupes humains interagissent, la « complexité » qui s'en dégage peut atteindre des proportions extraordinaires, révélant le summum de la grandeur humaine ou les abysses de la dépravation de l'espèce.

Les forces armées d'un pays constituent le moyen le plus puissant dont ce pays dispos pour faire face à un conflit humain très grave. Qu'elles soient engagées dans une guerre généralisée, mènent des opérations de sécurité ou accomplissent une mission humanitaire, elles incarnent la pleine capacité du pays à réagir avec rapidité et conviction. Pourtant, l'ampleur et la complexité des conflits sociaux modernes peuvent dépasser même les capacités considérables d'une force armée. De plus en plus souvent, les solutions aux conflits humains complexes doivent aussi être complexes – des solutions faisant intervenir divers organismes tels que les services de police, les premiers intervenants, d'autres ministères, des organismes non gouvernementaux (ONG/organismes de bienfaisance) et les forces armées. Par conséquent, les aspects politiques de ces opérations risquent d'être byzantins et la logistique, massive; en outre, les considérations morales et éthiques risquent d'avoir des implications étourdissantes.

Le Colloque S & T 2007 et ceux que l'on envisage de tenir au cours des deux années ultérieures ont pour but d'explorer la complexité des conflits humains et de toutes leurs ramifications. Afin de mieux structurer l'effort, les responsables ont organisé le colloque en fonction de trois thèmes

qui découlent des catégories de conflits humains que l'on trouve dans le drame. Après tout, le drame porte presque exclusivement sur les conflits humains, comme le montrent de nombreuses grandes œuvres historiques de fiction : *Guerre et paix* de Tolstoï, *Le vieil homme et la mer* d'Hemingway, *Hamlet* de Shakespeare, et *Les Misérables* de Victor Hugo, entre autres. La théorie du drame fait la distinction entre trois catégories de conflits humains : les conflits entre personnes, les conflits entre la personne et la nature, et les conflits entre la personne et elle-même. Les forces armées inévitablement composent avec les trois. Ce sont ces catégories de conflits qui détermineront la façon dont nous envisagerons notre environnement de sécurité dans l'avenir.

Conflits entre personnes :

Dans la théorie du drame, les conflits entre personnes vont au-delà des affrontements entre un individu et un autre. Ils ont des dimensions sociales et culturelles, étant donné que les sociétés et les cultures sont, en bout de ligne, composées d'individus. Par conséquent, une partie importante de l'énergie et des ressources d'un pays quelconque, que ce soit les services de police, l'appareil judiciaire ou les forces armées, sert à régler ou à empêcher les conflits entre personnes. On peut soutenir que ces derniers sont la cause la plus fréquente de l'instabilité sociale et que, de bien de manières, ils constituent la *raison d'être* des organisations concernées. La fin de la guerre froide et l'accroissement de la mondialisation et des interdépendances financières, les nouvelles valeurs (et intolérances) sociales ainsi que les idéologies politiques et religieuses en évolution exigent un examen des aspects personnes contre personnes du futur environnement de sécurité.

Conflits entre la personne et la nature :

La catégorie des conflits entre la personne et la nature ne comprend pas seulement les cas où les humains sont menacés par des catastrophes naturelles, mais aussi tous ceux où ils essaient de maîtriser la nature par leurs inventions ingénieuses, par l'application de la science, voire par des exploits physiques purs et simples. Dans bien des pays, les forces armées regroupent les plus vastes moyens dont l'État dispose pour relever les défis posés par la nature. Elles sont régulièrement obligées d'affronter de grands froids ou la chaleur torride, depuis la stratosphère jusqu'aux profondeurs de l'océan, tout en transportant ce qu'il leur faut pour survivre et pour imposer leur volonté. De bien de façons, les forces armées qui maîtrisent le mieux la nature (ou composent le mieux avec elle) ont un avantage lorsqu'il s'agit de réussir sur le plan opérationnel.

Conflits entre la personne et elle-même :

Les conflits entre la personne et elle-même découlent inévitablement des deux autres catégories de conflits, et ils menacent particulièrement les forces armées (ainsi que les premiers intervenants). Par exemple, les militaires vivent les pires et les plus troublants conflits entre personnes (violence extrême, guerre, génocide, etc.) dans les sociétés. Par ailleurs, quand ils appuient les pouvoirs civils après un tremblement de terre, une inondation ou une famine, les militaires font aussi face à bon nombre des pires conflits entre la personne et la nature. Aucune autre organisation n'expose ses membres à un éventail aussi vaste et aussi varié d'adversités humaines. Par conséquent, aucun autre groupe de personnes n'a plus d'occasions de vivre de profonds conflits entre la personne

et elle-même. En effet, dans de telles circonstances, il ne serait pas naturel si le militaire moyen ne souffrait pas de tels conflits. Comment ne pourrait-il pas (ou la société dans laquelle il vit) mettre en doute ses principes moraux, ses valeurs culturelles, voire son humanité? Et comment pareil doute influe-t-il sur le rendement tant de l'individu que de l'organisation?

Tout compte fait, notre futur environnement de sécurité est notre futur environnement humain. Pour nous préparer à relever ce défi, nous devons être prêts à nous étudier nous-mêmes.

This page intentionally left blank.

Executive summary

Colloque S&T Symposium 2007: Understanding The Human Dimension in 21st Century Conflict/Warfare - Comprendre la dimension humaine du conflit et de la conduite de la guerre au

XXIe siècle

A record-high audience of over 200 participants took part in the 2007 S&T Symposium, held 25 & 26 April in Ottawa. This was the seventh in the series of DRDC symposia, which has now become a DND symposium with the cosponsoring between DRDC and CFD. The opening remarks by the Symposium Moderator (Director General DRDC Ottawa) detailed the past symposia and noted that the symposium came together this year to explore the question of "The Human Dimension of 21st Century Conflicts" and will be followed by symposia planned for two subsequent years to explore the complexity of human conflict, in all of its vagaries.

In order to better structure the effort, the Symposium was organized along three themes that derive from the classifications of human conflict found in drama. Drama theory distinguishes three classes of human conflict -- person-versus-person, person-versus-nature, and person-versus-self -- and militaries inevitably deal with all three (See Abstract, Appendix A). It is these classes of conflict that will inform how we address our future security environment.

CFD gave the opening presentation on "The Future Security Environment in the 21st Century." He discussed the complexity of the modern battlefield which demands better leadership and a broader skill-set than ever fielded. He emphasized that to succeed a huge reliance needed to be placed on the strategically aware and tactically adept leadership of young officers and NCO; and that their actions – across the full spectrum of combat operations, complex counterinsurgency actions and humanitarian assistance – will determine whether the peace and stability in failed and fragile states will be achieved. ADM(S&T) followed by presenting "The S&T Challenges" which reviewed the Human Domain Challenges; and related these to the Defence S&T Strategy and the symposium abstract.

The symposium covered strengthening *situational awareness; shared understanding* and building *common intent*. There were a variety of international and domestic complementary views of theory, observation and conjecture (from people who have lived issues). There were a number of messages directed to the participants such as "the planning and execution of combat operations is difficult; delivering sustainable peace and well-being is considerably more difficult and; a profound comment that collateral damage is not a necessary consequence of war."

The participants were challenged in terms of the nature of future conflict. Referring to the issue of *shared understanding*, ADM(S&T) noted that there is a rich vocabulary of terms that by their very nature are about trying to grow a further understanding of what's around us – complex

adaptive systems, resiliency, whole of government, radicalization, effects-based, analytical warrior, stress inoculation, phenotype versus genotype, toponymy, the network versus networking, the human as an individual, collective or system. Among emerging themes, the first is the pervasive issue of *culture* (a mission enabler), but one has to understand the multi dimensions of culture (i.e. culture of the team, organization, society etc).

ADM(S&T) wrapped up the symposium by noting the event contained a very comprehensive and rich set of learnings for which we now have to answer the *so what*. The role of the chief scientist (corporate office) will be to answer the *so what* in collaboration with our partners in DND and our allies in order to develop a powerful program and learn from the symposium. When DND moves in to the eighth S&T symposium, this should be an opportunity to go beyond our current thinking of the human, as "we peel back that onion."

Sommaire

Colloque S&T Symposium 2007: Understanding The Human Dimension in 21st Century Conflict/Warfare - Comprendre la dimension humaine du conflit et de la conduite de la guerre au

XXIe siècle

Robert N. Webb; DRDC Corporate TR 2007-004; R & D pour la défense Canada – Corporate; Août 2007.

Le Colloque S & T 2007, qui a eu lieu à Ottawa les 25 et 26 avril à Ottawa, a attiré une très forte présence de participants dont le nombre dépassait 200. C'était le septième de la série de colloques organisés par RDDC qui maintenant est devenue colloque du MDN coparrainé par RDDC et le CDF.

Dans son mot de bienvenue, l'animateur de colloque, en la personne du directeur général de RDDC Ottawa, décrit les colloques précédents et annonce que cette année, le but de la réunion est d'explorer la question de « la dimension humaine dans les conflits du XXIe siècle ». Il avise également que d'autres colloques, prévus pour deux années ultérieures, suivront afin d'explorer la complexité du conflit humain dans tous ses caprices.

Afin de mieux structurer le travail, le colloque a été organisé suivant trois thèmes qui dérivent des classifications du conflit humain que l'on retrouve dans le drame. La théorie du drame distingue trois classes de conflit humain : le conflit entre personnes, le conflit entre la personne et la nature et le conflit entre la personne et elle-même, et les militaires affrontent inévitablement ces trois conflits (voir le résumé, à l'appendice A). Ce sont ces trois classes de conflit qui influencent la façon dont nous abordons notre futur environnement de sécurité.

Le CDF a donné la première présentation, intitulée « Le futur environnement de sécurité du XXIe siècle ». Il traite de la complexité du champ de bataille moderne qui exige un meilleur leadership et un ensemble de compétences plus étendu non éprouvés jusqu'à présent. Il souligne que pour réussir, il faut avoir grande confiance dans le leadership informé sur le plan stratégique et l'expertise tactique des jeunes officiers et sous-officiers. Il insiste que les actions menées par ces officiers et sous-officiers dans la gamme complète des opérations de combat, des complexes actions anti-insurrectionnelles et de l'assistance humanitaire détermineront si la paix et la stabilité dans les états défaillants et les états fragiles se réaliseront. La présentation suivante, donnée par le SMA(S & T) et intitulée « Les défis des S & T » traitait des défis du domaine humain et les mettait en relation avec la Stratégie S & T pour la Défense et le résumé du colloque.

Le colloque traitait des sujets portant sur le renforcement de *la connaissance de la situation, l'entendement commun* et le développement d'une *intention commune*. ont exprimé Diverses opinions complémentaires nationales et internationales sur la théorie, l'observation et la conjecture ont été exprimées par des personnes ayant éprouvé des problèmes. Un certain nombre de messages s'adressait aux participants, par exemple, « la planification et l'exécution des

opérations de combat sont difficiles; établir une paix et un bien-être durables est considérablement plus difficile » et un commentaire judicieux faisait remarquer que « les dommages collatéraux ne sont nécessairement pas des conséquences de la guerre ».

Les participants étaient confrontés à la nature du futur conflit. Invoquant la question de *l'entendement commun*, le SMA(S & T) note qu'il y a un vocabulaire riche, dont les termes, de par leur nature même, nous incitent à comprendre encore plus ce qui nous entoure : systèmes adaptatifs complexes, résilience, pangouvernemental, radicalisation, basé sur les effets, combattant critique, inoculation de stress, phénotype contre génotype, toponymie, le réseau contre le réseautage, l'humain en tant qu'individu, collectif ou système. À la tête des thèmes émergents se trouve la question omniprésente de la *culture* (outil habilitant de la mission), mais il faut comprendre les dimensions multiples de la culture (c'est-à-d. la culture de l'équipe, de l'organisation, de la société, etc.).

Le SMA(S & T) a récapitulé le colloque en notant que l'événement comportait une série d'apprentissages riche et complète dont nous devons maintenant déterminer *le suivi*. Il incombe au scientifique en chef du bureau principal d'assurer cette détermination avec nos partenaires du MDN et nos alliés, afin d'élaborer un programme solide et tirer profit du colloque. Lorsque le MDN s'approchera du 8e colloque S & T, celui-ci devrait être une occasion pour penser à l'humain d'une manière plus particulière, puisque nous sommes à décortiquer ce sujet

Table of contents

Acknowledgements

This page intentionally left blank.

1   Introduction and Opening Remarks

A record-high audience of over 200 participants took part in the 2007 S&T Symposium, held 25 & 26 April in Ottawa. This was the seventh in the series of DRDC symposia, which has now become a DND symposium with the cosponsoring between DRDC and CFD.

The opening remarks by the Symposium Moderator detailed the past six symposia and noted that these had not covered the area of social science. He noted that the theme of this seventh symposium "Understanding the Human Dimension in 21st Century Conflict/Warfare" set the stage for studying this area of science at this and the next two or three annual symposia.

2 Presentations by Co-Hosts CFD and ADM(S&T)

2.1 The Future Security Environment in the 21st Century

CFD gave the opening presentation on "The Future Security Environment in the 21st Century" where he congratulated ADM(S&T) and the S&T team for having championed this most important topic. He discussed the complexity of the modern battlefield which demands better leadership and a broader skill-set than ever fielded. He emphasized that to succeed a huge reliance needed to be placed on the strategically aware and tactically adept leadership of young officers and NCO; and that their actions – across the full spectrum of combat operations, complex counterinsurgency actions and humanitarian assistance – will determine whether the peace and stability in failed and fragile states will be achieved.

2.2 The S&T Challenges of 21st Century Conflict

ADM(S&T) followed and presented "The S&T Challenges" by reviewing the Human Domain Challenges. He related these to the Defence S&T Strategy and the symposium abstract, referring to the areas of person-versus-person; nature and self conflicts. He detailed some of DRDC research in this area such as where person-versus-person conflicts relate to the conveyance of intent in complex environments that involve humans and systems (information and knowledge management, visualization technologies, decision making tools and concept development methodologies). He concluded by analyzing the "understanding, prediction and influence of adversaries' intent" in assisting the CF to improve the their ability to understand and visualize: a) the root causes of adversarial intent; b) how such intent motivates behaviour; c) how to predict and countervail such effects; and d) how to measure our own effectiveness in achieving desired effects. Some solutions to this understanding are in analyzing "Collaborative Behaviour Among Teams, Agencies, Organizations and Societies" by identifying key social / psychological factors (e.g., establishing and maintaining common intent, shared awareness, swift trust, coordinated action, process gains vs. process losses, social loafing[1]); developing methods and tools to assess collaborative performance and; developing tools to optimize team behaviour and mitigate potential negative effects of team distribution and diversity.

---

[1] Social Loafing is the phenomenon that persons make less effort to achieve a goal when they work in a group than when they work alone.

3   Ingar Moen Memorial Lecture

3.1   Understanding The Human Dimension

A feature of the symposium was the first Ingar Moen Memorial Lecture given by Thomas Homer-Dixon, a well-known author from Toronto. Homer-Dixon started his presentation by stating that he understood Dr. Moen was the initiator of this annual symposium and was widely regarded as a brilliant, creative, and unorthodox thinker. He noted the following sentence that was deeply perceptive in the abstract prepared for this year's symposium: "More and more often, solutions to complex human conflict require complex solutions – solutions involving diverse organizations. As a result, the politics of these operations can be Byzantine, the logistics overwhelming, and the moral and ethical considerations dizzying in their implications." He challenged the audience in a "true Ingar Moen fashion" by stating: "Canadian and human security – broadly defined – urgently requires a radical new pragmatism. It's too late for the ideological grandstanding that passes for political discourse in our societies much of the time, and, more profoundly, it's too late for stubborn adherence to the rigid ontology that informs our conventional approach to problem solving. If our children and their children are to have a life worth living, we need to break through these barriers." A plaque was presented to Thomas Homer-Dixon by ADM(S&T) and Martha Stone (Ingar Moen's partner) to commemorate the first Ingar Moen Memorial Lecture.

4 Theory of Human Behaviour; Practical Experiences

During the afternoon of day one, participants were given a review on theory of human behaviour and culture from starkly different view-points discussing themes such as water security and asymmetric threats while deployed and at home; followed by practical experiences from both Bosnia and Afghanistan.

4.1 The Theory of Human Behaviour - Water

Jerome Delli Priscoli (Institute for Water Resources USACE and Editor in Chief -Water Policy) gave participants a history lesson in culture throughout the ages from a global perspective related to the subject of water and public policy. He described the conflict and cooperation to provide clean water from different cultures and historical perspectives. He talked of myths, water wars and political tensions caused by water scarcity; ancient evidence from the Chinese book of the Tang on operation of water wheels and of functional cooperation or unification of sates around river basins that can be found in Hammurabi's' code on operations of irrigation trenches. Continuing on the "history lesson" theme, he mentioned Rome and European rivers and water rights, through to floods, natural disasters and hydropower. In modern society, for water political culture of today, he reviewed a minimum platform of water resources infrastructure & institutions to achieve "water security,"[2] essential for sustained economic growth and poverty eradication. He spoke of the New Rhetoric[3]; Sustainable Development, Adaptive Management[4] and the "Precautionary Principle." He concluded by relating global water issues and security throughout history; building a new ideological and ethical consensus on water; reformatting messages and conflicting perceptions we are sending; creating the political will to act; understanding water as humanity's learning ground for building community and as forming society and; linking emergency response and development more seamlessly.

4.2 The Theory of Human Behaviour - Unravelling Terrorism

Gary Ackerman (Study of Terrorism and Response to Terrorism, START, University of Maryland) looked at the human dimension from the unravelling of terrorism as an exemplar of Person-versus-Person conflict. In anticipating terrorism, he discussed the fundamental impediments to predicting the actions of human beings[5], where terrorism is a very extreme form of human behaviour and compounds all the difficulties (hyper-dynamic, resilient, obscure motivations). He referred to specific problems; the clandestine nature of terrorist activities and the fact that terrorists generally are unavailable for comment. Once they become available, usually

---

[2] a) Security defined as freedom from fear anxiety, want deprivation; b) History of water management: good water, right time and place; c) Predict floods, reserve for drought, generate wealth, avoid deprivation, maintain ecology; d) Past seers and priests and origin of religion; e) Today synthetic hydrology, engineering , science f) Same end - security and water and; g) Water Security = common goal. Delli Priscoli, J 2007, DND S&T Symposium 2007

[3] Water myopia: a) Myopia of the water community; b) Water as an end – as a means; c) Change occurs when seen as a means mostly and; d) Water reform = political reform. Delli Priscoli, J 2007, DND S&T Symposium 2007

[4] Brings focus to design performance criteria; b) Ecologists challenged to dev indicators; c) Emphasizes feedback into DM; d) Pushes us to conscious choice of end. Delli Priscoli, J 2007, DND S&T Symposium 2007

[5] a) Dynamic; adaptive behavior; b) Diversity of possibilities for action; c) Incomplete understanding of human intent and; "Prediction is very difficult, especially about the future." Niels Bohr (1885 - 1962)

predicting their behaviour is moot. He referred to reasons why past events can be very useful but that there are potential disadvantages: the dynamic nature of threats and environments (generals fighting the last war); the velocities of escalation, the Black Swans[6]; and other discontinuities; signal versus noise and an over-reliance on past observables (and maybe missing the intangibles). He quoted Nassim Taleb "drivers looking through the rear view mirror while convinced they are looking ahead." He concluded with some thoughts: anticipating terrorist behaviour involves both art and science; maintain multi-perspective thinking at all times and embrace uncertainty by confronting the "unknowns" and the "unknowable."[7]

4.3   Practical Experiences – Bosnia and Iraq

Susan E. Campbell (Bionova International, USA and a registered nurse) prepared a presentation from her paper; see Appendix E.[8] She related to planning for resilience in the Face of Conflict, a study of the human dimension of a past (Bosnia) and present (Iraq) wars. She covered the areas of Nationalistic conflict that resulted from the economically-motivated break-up of Yugoslavia; partitioning that exacerbated ethnic cleansing by militarily dominant groups in predictable ways; predictive modeling of the displaced based on cultural census could be applied to Iraq and; non-violent collateral effects of war could be reduced by support of public health to improve resilience of civilians. In talking about the Balkan war as a preamble to 21st Century conflicts, she reviewed struggles for social and economic power that lead to culturally-based polarization; hostile groups who are defined by their nationalism that enables an "us" versus "them" mentality and that nationalism is a consequence, not a cause, of economic struggle and war. She contended that the type of nationalism reflects history, economics, ethnicity, religion, culture and geographic location. That responding to the sense of oppression, whether real or imagined, nationalism has the potential to propagate fear of victimization even while victimizing others. In cases of disproportionate power the potential for guerrilla warfare by the less powerful increases. Any interference in cultural conflicts from the outside is viewed as "help" by some and "occupation" by others, if even-handed, as "occupation" by both. She provided an analysis of the distribution of religious and ethnic groups and concluded by giving lessons learned from the study of Bosnia; the interventions by world powers that should involve census, maps and forecasting; the mitigation via best- and worst-case scenarios and the efforts to prevent health effects and; to provide the necessary defence of civilian population and infrastructure. She contended that by promoting resilience, one could reduce the humanitarian impact of cultural conflicts of the 21st Century giving examples in the health sector[9] and "Steps Needed to Reduce Collateral Impact of War."[10]

---

[6] "The Black Swan: Why Don't We Learn That We Don't Learn?" Highland Forum 23. Las Vegas, November 2003

[7] "The danger is not that we shall read the signals and indicators with too little skill; the danger is in a poverty of expectations – a routine obsession with a few dangers that may be familiar rather than likely.... The planner should think in subtler and more variegated terms and allow for a wider range of contingencies." *Thomas C. Schelling, foreword to Warning and Decision*

[8] Planning for Resilience in the Face of Conflict; Study of the human dimension of a past (Bosnia) and a present (Iraq) war. Susan E. Campbell and K. "Kas" Golubić; submitted to the DND 2007 S&T Symposium

[9] a) Many non-violent collateral effects are preventable; b) War planning should include support for predictable acute & chronic health conditions of civilians; c) Public health education may be the most effective intervention for resilience d) Little public health education has occurred in Iraq; e) Women, especially mothers, should be a main focus of public health education; f) Acute diarrheal diseases, communicable childhood illness and malnutrition <age 5 and; Chronic diseases like asthma, cardiovascular disease and diabetes >age 5. Susan E. Campbell and K. "Kas" Golubić 2007

[10] a) Security: retain public health professionals & protect infrastructure, especially supply chain and distribution points; b) Money: pay salaries of public health professionals, as well as doctors, nurses; c) Stockpile certain medications; revent

4.4   Practical Experiences – Afghanistan

Lieutenant Commander Wynn Polnicky (CORA) provided insight to NATO operations in Afghanistan by setting the context with quotations from a number of sources including books by Afghans, aid agencies and non-governmental organizations[11] and, in similar terms as the previous speaker, he provided an analysis of the distribution of religious and ethnic groups, detailed the tribal structure in the south and west of Afghanistan (Popolzai, Barakzai and Achekzai); asked who are the "Enemies" and stated in response "Illegally armed groups (hard-core Taliban/foreign fighters) looking for sanctuary and other armed groups (day fighters, drug traffickers and black marketers)." However, in terms as to "What's the Aim" for Canada, he provided an answer in terms of the direction from CDS.[12] He also quoted from the United States Marine Corps, Fourth Generation Warfare publication "Military force is incapable, by itself, of restoring legitimacy to a state. This is especially the case when the military force is foreign; usually, its mere presence will further undermine the legitimacy of the state it is attempting to support." The Afghan culture, he contended, is still not understood by the various occupying forces; this is amply demonstrated by monuments set up where the language used in English only (except for Canada where English and French is used). None of the memorials had a single word in the local languages. In wrapping up the presentation he made the points that; a) Kandahar is more complicated than one would think; b) all three lines of operation must be advanced at the same time; c) reporting must be complete and forthright and; d) the surest way to lose is by indiscriminately killing Afghans.[13] The problem is two-fold; the "control" of the major city (Kandahar[14]) and the local structure to the rural areas. Canada assists with "An embedded team of strategic planners with the Government of Afghanistan who, under the guidance of the Canadian Ambassador, assist in the development of national plans, and where possible shape and assist Provincial Reconstruction Teams (PRT) delivery of effects within the Kandahar Province." The 3-D approach is the political advisory DFAIT[15] and development advisory CIDA[16] area for roles

exacerbation/treat specific conditions; d) Underwrite health education for women to improve family coping and e) War planning should address true costs of conflict and involvement in strategy. Susan E. Campbell and K. "Kas" Golubić 2007

[11] Ali A. Jalali, "The Future of Afghanistan," … fighting terrorism should not overshadow the threats emanating from militia commanders, drug traffickers, corrupt provincial and district administrators, and government incompetence. Such threats are often more damaging to the population than terrorist violence. Sarah Chayes, Punishment of Virtue "There are no institutions, there are only powerful men." Afghan NGO Director, Kandahar "There are only three industries in the south, smuggling, opium and the gun."

[12] "The purpose of Canada's involvement in Afghanistan is to build that country's capacity to govern, providing the Afghan people a safe and just society in which every citizen - male or female - can speak freely, worship as they wish, pursue an education, enjoy the fruits of their labour and contribute to the growth and prosperity of their country through open and democratic elections." DND/ CDS - General R.L. Hillier, 2006

[13] "It is more important not to kill the wrong people than it is to kill armed opponents." United States Marine Corps, Fourth Generation Warfare 2005 and "One reason that the British have not lost in Northern Ireland is that they have taken more casualties than they have inflicted." Martin van Creveld, Israeli military historian

[14] The problem of numbers in the capital city … presents an intervening power with a situation quite different from that of a traditional insurgency: Unless the capital city is quickly brought under both control and visible order, the credibility - locally and globally - of the intervention as a force for stability drains away together with whatever political legitimacy the intervention possessed. Therefore, establishing control over the large populations of such cities must be a major objective at the start of any operation, from which the conclusion is that any intervention force must have large numbers at the outset of operations.

[15] DFAIT is a representative on HQ JTF – Afghanistan Staff is a necessity; the Commander is provided with political and policy advice, and analysis regarding the impact of the local, national and international political environment and events related to military operations, and vice versa and; liaison between JTF – Afghanistan and non-military government officials in Ottawa, Kabul and our missions abroad.

[16] CIDA representative on HQ JTF-Afghanistan Staff is equally critical; provide the Commander with economic and social development policy advice and analysis; liaison with the development officers at the PRT, the embassy and CIDA HQ;

and responsibilities. He further gave input on the future requirements for the Afghan National Police and Security Force (see appendix B). In terms of a final cultural quote he referred to General Zia-ul Haq, leader of Pakistan in 1979, speaking to the head of his intelligence service about Afghanistan: "The water must boil at the right temperature."

JTF-Afghanistan POC for the UN, NGO communityand other donors in Kandahar; Community, District and Provincial Development Assemblies- grassroots democracy.

5 The Military Response to the Human Behaviour and Practical Experience Presentations

5.1 Panel Moderator – Shane Roberts

The Military Response to the Human Dimension Panel (Human Conflict; Disasters; Social Instability) moderated by Shane Roberts (Policy Advisor, Science and Technology Policy Division, Public Safety Canada), responded to the presentations of the previous afternoon covering the theories of the human dimension and practical experiences from Bosnia and Afghanistan. The panel was introduced by reference to the sessions of Gary Ackerman and Jerome Delli Priscoli on two very different problems, but which like so many being covered during this Symposium, call for interdisciplinary approaches because of their inherent complexity. Mr. Ackerman sketched the multiple facets of terrorism and the variety of methods and analytical tools from the social sciences, with which he and colleagues are experimenting in an effort to make prediction and prevention of terrorism a more tractable problem for operators and policy-makers. Jerome Delli Priscoli laid out for symposium participants a host of historic, current and emerging issues related to water and its management - variously as a scarce resource and a destructive force of Nature. He showed that as the world's population grows and climatic change continues, these issues can be expected to become evermore acute for both developed and developing countries. The panel was asked to comment on "our ability to appreciate the depth of these issues, how they give rise to or drive conflicts, and how to manage and resolve these conflicts (that) will depend upon a diverse array of factors tied to and limited by current institutions and their ability to adapt." To help identify some of these factors, institutions, and requirements for adaptation, Roberts introduced the panelists:

5.2 Panellist – Doug Goold

Doug Goold (President, Canadian Institute of International Affairs) stated that he just returned from another remarkable conference.[17] What struck him was how many points of commonality there have been between the conference and this symposium. What was striking and a sign of the times, were the partners who were brought together for the first time. "What emerged out of a conversation 18 months ago between the CEO of Microsoft and NATO Supreme Allied Commander Transformation (SACT)[18] was about the need for public-private cooperation. The result was the conference with the principals from NATO – Secretary General JAAP de Hoop Scheffer; Microsoft – CEO Steve Ballmer and; BBC – Global News Richard Sambrook." Goold saw these as a unique and impressive trio, also joined by the Dutch Defence Minister and Lord Paddy Ashdown, a former Royal Marine who was the UN High Representative for Bosnia-Herzegovina. In both that conference and this symposium there was recognition of the speed of change and a sense of urgency. The Secretary General's point was *"Adapt to change, or Die"* (e.g. need to build a relationship with Pakistan; visit next month). The list of mutually discussed themes; show it is clear how important Afghanistan is to the future of NATO. Microsoft worked

---

[17] The Defence Leaders Forum promoting peace, openness and development Nordwuk on the sea, Netherlands 2007

[18] SACT is responsible to NATO's Military Committee, the highest military authority in NATO, for promoting and overseeing the continuing transformation of Alliance forces and capabilities.

with the UNHCR during the Kosovo crisis to design a tracking System for Refugees; highlighting the importance of Public Diplomacy.

Goold felt that "there is a need for the Military to reach out to civil society and the private sector" related to the globalization and immediacy of information in the world today. Goold pointed to a statement by the director of Policy Planning for NATO, Jamie Shay, who admitted that information travels so fast NATO sometimes doesn't know what was going on although bloggers might already know the information. He continued "There is a concern about the difficulty of confirming the truth of information and countering misinformation" and quoted Mark Twain.[19] "The immediacy will only get greater" he contended "supported by Microsoft who assured us that soon photos will be able to be posted on the Internet in real time." From Goold's perspective there was a strong sense that Al Qaeda and the Taliban are doing a great job of getting their story and their pictures out to the Public and questioned "who was the Public Relations winner in the recent crisis over the capture of British troops by the Iranians" … "local media is important, but usually ignored." He pointed to the fact that the Afghan Ambassador to Germany – a woman – said that the explosion of local media in Afghanistan has had a great impact on Afghan opinion and asked "what foreigners read the Afghan media, to see what it says about Canada, the US, or NATO?" He then quoted Lord Ashdown.[20]

Goold concluded that we absolutely need a comprehensive or 3D (whole of government) approach and have to be ready for post-conflict reconstruction in Afghanistan.[21] He then referred to a Dutch General who heads training, and led Dutch troops in Afghanistan – far more of a demanding role for the modern soldier with four roles: Warrior, Intelligent Officer, Trainer, Reconstruction Worker – thus the importance of the Human Dimension. Quoting from BBC war correspondent John Simpson who stated soldiers are trained to watch for attacks, he concluded that NATO will pay heavily for their many mistakes. He wrapped up by stating that "we need to show Afghans their lives are getting better and that NATO is there as long as they are needed, a promise we probably can't honestly make. The wrong approach is simply to kill a lot of Taliban. The right approach is to show that the Taliban are not the way forward for Afghanistan. "Talk honestly about your real motives: stability – good; keep us happy – fine; social progress and women's rights" he said. Does one really want to have hundreds of casualties and spend billions to impose our view of women's rights on an ancient tribal society? How do we measure success? We will never have a victory like 1945."

5.3   Panellist – David Rudd

David Rudd (CORA) described the analyses of complex military operations that encompass the roles played by new technologies and organizational concepts, by non-military actors and, by a new generation of adversaries with non-traditional centres of gravity. He stated that any thorough exploration of the human element of conflict requires a measure of self-analysis. He continued "it is unusual for the practitioners of security policy to critically assess the politico-psychological make-up of their own countries and peoples as they embark upon potentially dangerous missions abroad." He contended that although there have been many works on Canada's political culture,

---

[19] Mark Twain: "a lie can travel halfway around the world while the truth is putting on its shoes."

[20] Lord Ashdown: There has been a paradigm shift, the crucial battlefields is the battlefields of public opinion

[21] "We are not in Afghanistan to fight, but to create an environment for reconstruction. If that's case, we are not succeeding" NATO Secretary General JAAP de Hoop Scheffer 2007

this body of research is seldom referred to in the making of foreign and defence policy. The contentious issues of "Who are we?" and "What are we prepared to do to promote our own security?" are infrequently explored or discussed outside academic circles. He questioned that if Canada and its traditional allies do not come to better grips with what their political cultures will permit to promote security, they may be unable to cope with the rigours of 21st-century conflict.

5.4   Panellist – John Verdon

John Verdon (Senior Strategic Human Resource Analyst, CMP) outlined his comments as covering new paradigms, new concepts and new capabilities (see appendix F for more details). These areas had inter-related complexity, with the convergence of "one-world" affected by climate change and related to a "whole of government" approach. "It is really important to know ourselves" he stated, by studying the human psyche in a pre-modern, modern and post-modern society.[22]   He suggested that one needs to respect the culture of all peoples; the war-among-people is long and has deep confrontations. In our society the clash between cultures is seen in the "war on Christmas" versus the "war on science" and creationism versus evolution. Today there is a zeitgeist of immanence, the singularity, global warming/environmental collapse, end-of-times and more. The unknown looms everywhere eliciting fear, excitement and future-shock. Framing is all important – what is the story of tomorrow? People are the agent of revolution; first a primate that depends on culture – Chimpanzee gene over Human gene; people are controlling their genes. All *Change* is a battle between ideologies as old ideas compete with new ideas for attention, resources, prestige and dominance. Defence is not a blank slate upon which new social patterns can easily be etched. It is more dimensional – where layer-upon-layer of social practice has been laid one atop the other. Socialization processes are so sophisticated and so powerful, that to introduce change without paying attention to how to "define ourselves today" is to court failure. Power, profession, tradition, workforce, culture, trust and leadership are all open to re-interpretation because network enabling technologies come with philosophies of broad participation; distributed power; independent action; interdependence; collaborative decision-making; incomplete strategy; communication and feedback; diversity; life-long learning etc. When one thinks about making the transition to a network-enabled force – with rapidly evolving and changing new technologies and emergent capabilities, one should be clear that this is a battle between the old and the new. The battle is not rational or intellectual – it is *emotional* and *cultural*. As Thomas Homer-Dixon noted of Hans Morgenthau – the vital importance of a 'respectful understanding' of one's adversaries – "The political actor must put himself into the other person's shoes, look at the world and judge it as he does." Verdon contended that this is but the first step to mutual "respectful understanding" to make the meta-step to a common understanding and to reach, as J D Priscoli noted, the necessary super-ordinate values. In concluding Verdon summarized the challenges as: a) The "people" component is the largest, most expensive and longest planning framework and the most protected, least risked asset; b) Emerging technologies are leading to new ways of working – in fact one needs a new theory for Personnel Management, which must integrate with Human Integrated Systems; c) There will be cultural change as a result of technology and as new generations join the Military; d) The military will need to develop people that might have to go through multiple major technological changes

---

[22] Social closeness does not mean physical closeness. However, unlike traditional public meetings in community centres or pubs, network relationships can be more selective. Networks tend to contain higher proportions of people who enjoy one another and a lower proportion of people who are forced to interact with each other because they are juxtaposed in the same neighbourhood, kinship group, organization, or workplace.

with consequent career and occupational change (mastering transition and transformation) and; f) Training, (plus re-training, plus meta-training) to maintain the same rank – an exponential increase to advance in rank. The future recruit will have to be educated, multi-skilled, team-oriented and more social and technology savvy.

6   Inter-Agency Operations and Lessons Learned

The human dimension in inter-agency operations was presented by retired Colonel Mike Capstick, who covered the international commitment to Afghanistan and lessons at the strategic and political levels. He described the coordination of the international effort in Afghanistan and looked at the situation from the Taliban to the Afghanistan Compact stating that there were missed strategic opportunities. He contended that the alignment with the Afghanistan Compact and Afghanistan's national development strategy were an opportunity for Canadian and International "3-D" efforts and; strategic lessons from previous attempts to bring law and order in Afghanistan were not learned. He detailed flawed concepts as: a lack of "boots on the ground" and an over-reliance on airpower and surrogates; no "post-military" strategy and no international vision; a violation of the principle of "unity of command" and the limitation of international effort to Kabul. In his view serious errors were made in the development of ANSF and a failure to secure the population (mainly rural). The Bonn process had no agreed international strategy beyond the process itself and a political framework alone, which he felt was insufficient. The Afghan institutions needed support to increase the human capacity. The security of Afghanistan was imperative; but beyond a military strategy, there was no comprehensive security strategy to bring law and order to areas other than Kabul. Further, no follow-on strategy for Afghanistan existed.

7   7. Military Research Related to the Human Dimension

7.1   International Military Programs – The Human Dimension

Speakers came from Australia, the United States and the United Kingdom to give both their perspectives on the human dimension and to explain the military research programs that their countries employed in this regard, followed by a respondent who interpreted the presentation, relating it to the needs of the Canadian military. Canadian programs wrapped up this part of the symposium from DRDC Toronto and Valcartier.

7.2   Australia – Richard Davis

Richard Davis (Head, National Security Science and Technology Unit, Prime Minister and Cabinet Department) presented some characteristics of future conflict such as Network Centric Warfare; Effects Based Operations and multi-agency operations and; National Security & Counter Terrorism.[23] He also referred to some characteristics of future S&T, which impact the human dimension. In terms of road-mapping, the Australian NCW roadmap does not include NCW. It is not NCW it is People Centric Warfare (PCW). Australian's understood this, as the non integrated-gap countries are all around Australia, which is why Australia learned so well. He continued with "The Challenge of the Seamless Force, The Role of Informal Networks in the Battle-space" which led to research into the Human Dimension of war-fighting.

The goal of human dimension programs was to understand how individual, cultural and organizational factors affect the integrated agile force, and to map a transformation path for the Australian Defence Force (ADF). This required a project of "structured interviews" with a total of 82 personnel who returned from the Middle East and were stratified across ranks, services and gender. This was to produce lessons learned from Middle East Area of Operations (MEAO).[24] This study input to Australian NCW Roadmap on planning, training and education of the future force (i.e. professional mastery); the identification of overarching skills/competencies required for future force; developing a high level ADF specific framework of metrics for required skills/competencies and; bench-marking current standing of requirements and determining milestones for a transformation path.

With respect to C2 arrangements and processes, those interviewed spoke of their frustration with commands that were perceived to be convoluted, confusing and/or irrelevant. In large part, these pertained to command from strategic and operational Headquarters located in Australia. Many participants saw service-specific chains of command as particularly troublesome in this regard. More specifically, the need to defer to service-specific command lines was often seen to involve the duplication of effort (e.g., reporting). Furthermore, service-specific command lines were widely perceived as leaving many in-theatre personnel redundant. Not surprisingly, chains of

---

[23] Recommended reading Durkheim on topology of suicide

[24] Authors: Leoni Warne, Derek Bopping, Irena Ali, Dennis Hart, & Celina Pascoe. Major findings relating to: Joint and Coalition training; sensemaking in battlespace; cognitive demands and abilities; collaboration, interdependence & relationship management; team work and informal human networks Contact: leoni.warne@dsto.defence.gov.au

command that were perceived to be convoluted or irrelevant were often bypassed. In this vein, participants spoke of the emergence of "informal" command lines that were perceived to be more effective and/or efficient. This is well illustrated in the quote from the report:

> *We are sufficiently small that you can in fact ignore certain chains of command and just ring up CDF or just go here or go there and you will still get the outcome that you are trying to achieve. You might annoy a hell of a lot of people on the way, but you can afford to do it.*[25]

Counter-Terrorism coordination relies on strong cooperative, coordinated and consultative relationships. The Prime Minister and Cabinet (PM&C) have a central whole-of-government policy coordination role and co-chairs the National Counter-Terrorism Committee which has no operational role. The Protective Security Coordination Centre (PSCC) has a central whole-of-government operational coordination role. High level of cooperation and coordination are required between PSCC and PM&C. For more information see Appendix A.

7.3   United States – Sharla Rausch

Sharla Rausch (Sharla P. Rausch, Director, Human Factors Division, Science and Technology Directorate, Department of Homeland Security), introduced her presentation with the Human Factors Division (HFD) Mission Statement

> To apply the social and behavioural sciences to improve detection, analysis, and understanding of the threats posed by individuals, groups, and radical movements; to support the preparedness, response, and recovery of communities impacted by catastrophic events; and to advance national security by integrating human factors into homeland security technologies.

This requires them to *"Know our enemies, understand ourselves; put the human in the equation"*

There are two divisions within HFD: a) Social-Behavioural Threat Analysis – covering motivation and intent and; suspicious behaviour detection and community preparedness, response, and recovery and b) the Human-System Research & Engineering – covering personal identification systems; technology acceptance and integration and technology-human integration. From the publication, "Making the Nation Safer" she quoted "None of the related problems [of terrorism] can be solved by technology alone; every solution is subject to the reality of being implemented and operated by humans. These are system issues, where individual, social, and organizational behaviours are part of the system and, therefore, must be part of the research and design."

7.4   United Kingdom – Andy Nicholson

Andy Nicholson (Senior Program Leader, Defence Science and Technology Laboratory, Ministry of Defence (MoD)) asked initially why the UK MoD needs a human systems capability. As a response to his question, he stated that human science expertise and input is crucial in: a)

---

[25] Report on lessons learnt from Middle East Area of Operations (MEAO)

maximising the performance of the human in the system b) mitigating the risk of human error and c) ensuring the optimal performance of complex systems. He described the UK Human Capability Domain Structure as covering both research and support to UK programs. There were seven major research areas he detailed: Duty of care and health; Impact of emerging technology on humans; The human and Through Life Capability Management; Cognition, awareness and decision making; Training; Influencing human behaviour; Recruitment and retention; Overview; Research Programme; Emerging Technologies and; New opportunities and challenges.

His presentation then detailed each program area and showed how the output benefited the forces such as the conduct of anthropometric surveys of personnel using three dimensional scanning laser; recommendation of any changes to equipment as a result of the changing size and shape of personnel and; ensuring that medical treatments are developed to provide the best quality of protection and care for our armed services. He also detailed a new program looking into the role of the human, within Through Life Capability Management. This new program will include aspects of understanding how changes in other lines of development can impact on the equipment line. The research will scope the nature of the issue and develop models and techniques to understand cross the line of development trade offs. He concluded with a few examples of emerging technologies: electricity from movement, neuroscientists the break code on sight, crocodilian haemoglobin and even the human catapult![26]

7.5 Canada – Keith Hendy (Toronto)

Keith Hendy (Deputy Director General, DRDC Toronto) opened with a description of conflict; as conflict portends to human society. Conflict,[27] although occasionally constructive, is usually a complex disruptive force whether experienced at the individual, collective, cultural, societal, or state levels. Conflicts can arise between entities whose intent is either to be cooperative or non-cooperative. When the conflict involves humans, behaviours can be extremely complex, as we are purposeful goal driven organisms that act on our internal and external environments such that variables of interest are moved towards desired states. When the achievement of these states is delayed or prevented there is the potential for conflict. Our societies, governments, organizations, and militaries all exist to serve the human purpose …at least this is the secular point of view …and all have a role to play in resolving conflict. Therefore, it is largely though a comprehensive understanding of the human condition that we will better know what the nature of human conflict is, and how we should design, organize and populate with appropriate technology, those organizations and institutions that exist to prevent or mitigate the consequences of conflict.

Awareness of the importance of the human dimension is permeating through the S&T programs of many developed countries, and Canada has responded to the call. DRDC Toronto is Canada's centre of excellence for integrated human-effectiveness S&T, for the defence and national

---

[26] Electricity from movement http://www.technologyreview.com/, neuroscientists break code on sight http://web.mit.edu/newsoffice/2005/visualcode.html, crocodilian haemoglobin http://www.abc.net.au/science/news/health/HealthRepublish_1191825.htm and even the human catapult http://www.newscientist.com/article/dn9170-invention-human-cannonballs.html!

[27] **con·flict** *n* 1) A continued struggle or battle, especially open warfare between opposing forces; 2) a disagreement or clash between ideas, principles, or people; 3) a psychological state resulting from the often unconscious opposition between simultaneous but incompatible desires, needs, drives, or impulses and; 4) opposition between or among characters or forces in a literary work that shapes or motivates the action of a plot. vi to be incompatible, in opposition, or in disagreement. Encarta® World English Dictionary © 1999 Microsoft Corporation. All rights reserved. Developed for Microsoft by Bloomsbury Publishing Plc.

security environment. Using a systems-based approach, the centre broadly covers aspects of human performance and effectiveness, including individual and team performance, human-machine interaction and the influence of culture on operational effectiveness. Human-effectiveness S&T addresses the human condition along the following dimensions: the Human as an Individual; the Human in a Collective and; the Human in a System.[28] To fully address human conflict in the real world, those who have expertise in the human domain will need to work with those whose expertise is in the physical and information domains to produce systems level solutions for the defence and national security environment.[29] These systems level solutions must speak to the challenges of the increasing complex world of human conflict. Our reality exists in a world defined by notions[30] that are effects-based, and an adversary that attempts to leverage asymmetrical methods to achieve their goals.

Hendy then looked at the way ahead for the human domain and what one might expect from the Enterprise in the area of future human domain S&T. These were the study of adversarial intent; a human of systems and capability engineering paradigms; decision support systems built around a theoretical framework of human decision making; understanding of the societal and cultural aspects of collaborative and collective behaviour; advanced military and security systems will be correctly captured during the acquisition process and; advanced protection, integrated with operational personnel equipment ensembles, to enhance capability while improving survivability in hostile settings (*see Appendix C for details*).

He concluded by talking about conflict having a human origin that will also have a human resolution. While conflict resolution is enabled by technology, a state of conflict will only be removed when the goals of the actors are met to a level of satisfaction that balances perceived costs of continuing to act, against the perceived rewards of achieving the goals. Therefore understanding the human condition is central to understanding the nature of conflict. Human behaviour derives from our perceptions of the state of world in the context of our goal structures or how we would like to see the world. Concepts such as 3D, Whole of Government, JIMP and effects-based operations, are recent attempts to organize ourselves to deal with conflict in ways that are more cognizant of the human domain and the search for a human solution.

7.6   Canada – Yves van Chestein (Quebec City)

Yves van Chestein (Information and Knowledge Manager, DRDC Valcartier) talked of the Military Geography of Human Conflict Situations. He opened by stating that the human's first

---

[28] The Human as an Individual; Body, mind, and soul: physiology ~ cognition ~ motivation ~ ethics & morality; The Human in a Collective; Groups of bodies, minds, and souls directed towards a common purpose and; The Human in a System; Bodies, minds, and souls working together (or in opposition) in technological, organizational, and societal systems

[29] The Centre for Operational Research and Analysis (CORA), the Chief of Military Personnel (CMP), and the Royal Military College (RMC), are central to advancing the state of human domain knowledge within the Enterprise. Similarly, other centres within DRDC, together with Level 1 organisations such as ADM(MAT) and ADM(IM), will connect human domain knowledge with that of the physical and information domains to produce systems level solutions for the defence and national security environment.

[30] such as the *Defence, Diplomacy and Development (3-D)* and *Whole of Government* approaches to conflict resolution, operations that are *Joint, Interagency, Multinational and Public (JIMP)*. No longer does an ability to deliver superior kinetic effects guarantee success on the stage of 21st Century conflict, and perhaps it never did. If the resolution of human-human conflict requires that two or more actors must move towards a mutually satisfying achievement of goals, then the solution will be found in the human domain.

battle was for survival against animals. The traditional combatant is easy to spot … "he stands in front of you with an obviously malevolent intent in his eyes and possesses an official military status. The commando is the raider of the lost ark. He can prove very efficient because of the covert nature of his interventions. One typically sees very little of him but much of the fruit of his labour. El guerillero is an insurgent … he/she appears and is motivated by a different impetus. The suicide bomber is ready to die for a cause, and ensures that many others die for his cause as well. The bomber blends in with the crowd, and is particularly difficult to identify; also once identified, to neutralise. The 10 year old kid is often recruited by force but nevertheless carries a Kalashnikov that he merrily unleashes in your direction, and then promptly drops."

Rules of engagement tend to be uncomfortably foggy about this situation. To engage or not to engage, that is the question. Cyber-warriors use the web to plan their actions, to post counter-measures to initiatives and weapons, and for other creative purposes. In this case however, they do not fight face-to-face, but through the anonymity of the Internet. They are likely to become a growing threat in the years to come and DND can perhaps expand on this aspect in the 2008 S&T symposium. The many reasons for insurgency were given with a review for the reasons for engaging in battle; deciphering and representing the conflict situation and; knowledge of terrain and country (see Appendix D for details).

Discussing the conflict itself: Human versus Human over Land (human may also mean groups of humans), where the "situation" equals the "site-of-action" – both Nature (terrain) and Culture (land). There are strong positions and limits of dominant versus emergent groups while the conflict matures, erupts, then evolves and lines and spots of lasting conflicts are more zones of equilibrium than fronts and forts (Cyprus is an example). Carl Von Clausewitz might not be immediately perceived as a geographer, but he certainly brought a geographic comprehension to military operations. He defines war as an extension of politics onto the territory. The three principles (strategy, operations and tactics) appear simple enough to integrate but as in many triads, one element always seems to escape the binary minded, which inevitably causes them to fail when attempting to apply these principles. One reason being that strategy, operations and tactics operate at very different scales.

The relationship between one and the land will vary greatly, such as if you are a nomad roaming the steppes of Asia, or a businessman clinging to a sizeable chunk of real-estate in Manhattan. In this context the adversary might want to know where we will enjoy a "cold one" (iced tea) after hours, while we want to know when and where they will attempt to entice "us" to die for their cause. Many people in the world can read English, so the American way of life is well-known. However, many Anglophones can only read English. And until you have walked a mile in someone's shoes, you cannot easily grasp all the subtleties of their culture. One only has to look as far as this country for examples. Place names are entwined with culture. The Serbs migrating west-ward on the military frontiers had a habit of naming Bosnian towns they settled after their own towns, thereby implicitly establishing moral sovereignty, by geographical counter-reference. During the first Gulf war, (Desert Storm, liberating Koweit/Kuwait), many air and ground strikes on targets identified by inaccurately translated place names hit wrong locations, causing all kinds of (collateral) losses. Summarizing the Humans and their home theme (the place where a human was born or where a human lives) usually means something very special to that person that may prove difficult for an outsider to fully comprehend. However, any intervention that affects or endangers that relationship may bear unforeseen consequences.

Continuing this theme with forms, forces, ruptures, and symbols; one may deem it important to make soldiers aware of various elements in the terrain that express the intentions, occupations or actions of one or the other belligerents. These elements may be seen as irrelevant, inconsequential or event insignificant to foreigners, but may very well have a direct bearing on the outcome of the operation. He detailed the themes as:

- Semantics, Semiotics, Semiology: the meaning or relationship of meanings of a sign or set of signs

- Toponymy: the place names of a region or language or especially, the etymological study thereof; the search for the sense of place inscribed in a place name

- Limology: a scientific study of borders, their significance and effects; Political, cultural and cognitive geography

In concluding, the point was made that *Intelligence* is essential; *details* can make or break an operation – SIGINT (data) → HUMINT (info) → GEOINT (knowledge). In the area of the human dimension, DRDC does research to provide geo-intelligence and strives to give the CF an edge.

8   Conclusions and Wrap Up

ADM(S&T) commenced the wrap up by referring back to the question posed by CFD of *objectives* which ADM(S&T) followed up in his own presentation. The symposium came together to explore the question of the Human Dimension of 21st Century conflicts; so what does this mean for S&T? Borrowed from the theory of C2, this event was about strengthening *situational awareness*; about *sharing understanding* and about building common intent. There were a variety of complementary views (international and domestic), theory, observation and conjecture (from people who have lived issues); differing views that have been equally elegant in their content and their message. One might juxtapose the views by Thomas Homer-Dixon and Yves van Chestein; largely in the same domain compelling in their elegance and the profoundness of their message. There were some profound comments in the second day military response panel on the above which are covered below. There were a number of messages directed to the participants such as the difficulty of planning and execution of combat operations; delivering sustainable peace and well-being is considerably more difficult and; a profound comment that collateral damage is not a necessary consequence of war.

The participants were challenged in terms of the nature of future conflict. While recognizing conflict as a very human centric reality, which could be routed in increasingly complex interactions between nature and the human where such factors as the inter-play of the environment, energy, resource pressures and others may be new sources of conflict that we may not have experienced to the extent that we have in the past. The world is not quite as simple as black hats and white hats. Who is the enemy? Referring back to the issue of *shared understanding*, there is a rich vocabulary to be expanded upon; terms that by their very nature are about trying to grow a further understanding of what's around us – complex adaptive systems, resiliency, whole of government, radicalization, effects-based, analytical warrior, stress inoculation, phenotype versus genotype, toponymy, the network versus networking and, the human as an individual, collective or system. What are seen emerging are certain themes that speaks to a common intent in moving forward. Among those themes, the first is the pervasive issue of *culture* (a mission enabler), but one has to recognize the multi dimensions of culture (that is culture of the team, organization, society etc). It has been realized that *situational awareness* is imperative to mission success. Awareness is more than can be conveyed in a recognized picture. It is ultimately in the head of the human, and the question is which head, which comes back to the individual and the collective.

One should relate to this the notion of *decision support* and collaboration, information and knowledge and, perhaps new ways of informing *conflict*. Consider the importance in, but the difference between *sensing* and *sense-making*. The importance of *trust* and *shared intent*; but realizing that is required at multiple levels, each level changing the context and conditions somewhat – from the team to the organization to societies to cultures. That *creativity*, which is at the heart of what it is to be human, is something that requires some science to better understand how one can put the conditions in place that would increase both its' frequency and its' potential for *positive disruption*. And finally complexity; one needs new ways of thinking about problems and, the notion of *complex adaptive systems* that potentially provides a complementary way of both thinking about and solving problems, but much needs to be done. This notion of the *human dimension* is wrong; there is only one dimension and it is the human dimension; and one needs to put it at the centre and build it out from there.

The Symposium Moderator added to the closing remarks of ADM(S&T) using the input from the symposium respondents by stating the human is the most complex system of all, the human is at the centre of net centric warfare, yet our focus is still largely on platforms, not people or HR policies. The integration of the other systems on the human system is needed. In 4th Generation Warfare, the vital ground is the *Mind* (to better understand the black box). Understanding the human dimension is a challenge in balancing the use of imagination with the use of rigorous empirical sciences. That idea of creativity and imagination, balanced with science. *Lessons learned* came through many, many times in the discussions. It is clear that reflective individuals can learn from their experience. Transforming the knowledge gained in to a common asset requires a concerted effort to share that knowledge institutionally; so it is more than just individual learning. Thus came across as significantly lacking in most of our organizations.

Sometimes one has to do this across lines of communication that have yet to be invented. Building inter-departmental teamwork (just like building international cooperation) requires *cross cultural awareness* of different perspectives and sensitivities. *Multi-disciplinary* approaches can help us to tackle the *complexity* of the human. Perhaps to the roster of the scientists one should consider adding *historians*, as they have an awareness of the interplay of human and technological forces. The *historian* part ties to *lessons learned*; there appear to be many lessons to be learned from history which have not been learned as history repeats itself. Our *culture* has us act in our national interest; and self knowledge is very important. One needs to be aligned with society. In society where war fighting is not a popular word, one needs to be mindful that alignment with society is important and is the centre of gravity for our military operations. Public acceptance of technologies is important. As technologies are introduced, there is an effect and risk of these new technologies on personnel.

One needs to get a scientific grip on *complexity*. There is a need for a fundamental and *comprehensive generalizable and theoretical framework* for the social science on which we need to base S&T advice. It is pretty clear from the symposium that the demand for knowledge and advice from the social sciences is very high. John Verdon introduced us to many ideas in a short time. Some of these ideas are already being used in avant-garde businesses, but governments are not using them much in the public sector yet. So there is a fundamental knowledge base that one can access and apply (Wiki's plus, self-organizing, peer mentors, strategic corporal website etc), which is the mixture of *hierarchical command* and *market-driven distributed capability* to be implemented. The Soviets know very well command driven societies don't always work that well and those market driven are very powerful, but you need a combination of both to really work effectively.

In concluding it was noted that the symposium contained a very comprehensive and rich set of learnings for which DND now have to answer the *so what*; what do we do with the output of this symposium. This will be role for the chief scientist of the corporate office, to work with DRDC partners within DND and our allies to bring it together and form a powerful program and; learn from the symposium. These symposia have been getting more complex but effective. When CFD and DRDC move in to the eighth S&T symposium, this should be one more opportunity to go beyond our current thinking of the human, as we "peel back that onion."

This page intentionally left blank.

Annex A   Davis – Australia

Military/Service Culture

> • For many participants, deployment to the Middle East was their first experience of the need to work closely with personnel from other professions, Services and/or nations. Thus, they often spoke at length about the similarities and differences between their professional, Service and/or national cultures and expressed their thoughts about how this may affect their work and modern operations more generally.

> • A salient theme in this respect concerned the strong cultural or 'in-group' identity that characterised effective teamwork and cooperation. Specifically, participants often spoke about how the culture of their profession, Service, or nation provided a sense of shared purpose and thus a basis for cooperation.

> • Given the need for personnel to develop cooperative relations with those of other professions, Services, or nations, it was not surprising to find that knowledge of other cultures was widely regarded to be particularly valuable. This facilitated the emergence of informal networks as a means by which such knowledge could be obtained.

> • Also not surprisingly, personnel often spoke of clashes in culture in their explanations of the difficulties in achieving cooperation. One example of this is illustrated in the quote below.

> Report quote: *I did see that where new tradesmen were brought in to replace other tradesmen who finished their tours, and that is where I saw some interesting clashes, and once again, just between different cultures of bringing in other Service personnel...bringing in Air Force personnel to replace Army personnel and vice versa, and people just have different expectations on what is required.*

Relationships and Trust

> • Interdependence and effective collaboration is at the core of a Seamless Force. In many locations in the Middle East theatre, interdependence with other Services and countries in Joint and Coalition units was a fact of everyday life. Some interviewees found this problematical. For example, many spoke of how Service and national boundaries acted as barriers in the development of effective intergroup and interpersonal relationships.

> • Others found that collaboration with other units within the Australian contingent and with the Coalition forces was dependent, to a large degree, on building good informal relationships. Good interpersonal relationships, in turn, enabled the development of trust. Often, this trust was consciously developed through face-to-face contact, and once established, facilitated further collaboration.

> • This collaboration provided access to information, knowledge, equipment, general support, and other resources. This is well illustrated in the following quotes.

> Report quote: *...because I'd built those relationships...he would bend over backwards to make sure that we got what we needed and I guess that sort of became my role in many regards. It was basically good business...to keep up good relationships with the*

Americans. We took it as an opportunity to draw on their mass of knowledge and experience…So, to work with these guys and to take on as much information as you could, was invaluable.

Implications

What are the implications of the above for the ADF?

This research suggests that the way in which humans share information, work together and cooperate in the theatre is based, to a large extent, on the establishment of relationships through socially mediated means, enabling more effective cooperation between different organisational entities. This suggests that through more emphasis on Teamwork, Joint ADF Coalition Training and shared Operational Experience, we can improve efficiencies in the battlespace. This leaves us with the following questions:

Teamwork

• Is there enough emphasis on teamwork, teambuilding and relationship building in our current ADF training programs?

Report quote: *…you need a team that is going to be coherent under stress…a dream team, and you never get one of those, but if I had the chance to pick the dream people I would pick people that worked well together.*

Joint and Coalition training

Should the ADF move towards Joint competencies and Trades training, and increase opportunities for more Joint Education and Training to facilitate teaming and seamless jointness?

• Should more effort be invested in fostering inter-unit and inter-Service linkages and relationships within the ADF through, for example, relatively short-term/familiarisation cross/exchange postings of personnel between units?

• Should we create more opportunities to further engage in exchange postings with other Armed Forces with whom it is likely that Joint operations or other collaborative ventures will arise?

Report quote: *The whole working in the Joint environment, we need to do a lot more of that. And I think that starts at the training; we need to re-align and we need to align our Service communications, skillsets and training.*

Visibility or knowledge of what the other Services' skillsets are and how they operate. And what - what backgrounds, I suppose, each of them have. Or if you are an Army guy, to have knowledge of what the naval assets are. Same with the Air Force and vice versa, so all around tri-Service type knowledge.

Operational Experience

Should ADF members' operational experience and preparedness be increased by rotating more personnel through operating environments on shorter deployments, by encouraging exchanges and secondments to coalition partners in operating environments and by developing more realistic, adventurous training exercises?

What is EBO/NEBA?

• The application of military and non-military capabilities to realise specific and desired strategic and operational outcomes in peace, tension, conflict and post- conflict situation[31]

• A National Effects Based Approach (NEBA) represents an emerging concept which synchronises all elements of national power to secure national security goals[32]

• Whole of Government/National Approach

Command and Control

• Overall Foreign Affairs Lead/Coordination [33]

• Police lead for Law and Order, disarmament

• AusAID lead to stabilise financial systems, courts, and re-build prison system

• ADF supported – secure environment and logistics

• Treasury and Finance – Economic Governance

General Findings

• WoG approach never done before to that extent

▪ Increasing intergovernmental interaction over past years

▪ Clear direction from Cabinet that departments were to work together

▪ Cultural differences were certainly encountered between departments due to difference of aims and nature of work conducted.

• WoG issues quite similar to coalition issues

▪ Interoperability

▪ Culture

▪ Security

Recommendations

▪ Nurture informal relationships and networking

▪ Create doctrine/processes that are available to (and interoperable with) other government departments

---

[31] Future Warfighting Concept, p. 12

[32] The four elements of national power are diplomatic, information, military and economic (DIME).

[33] DFAT head – Nick Warner as special coordinator (now Defence Secretary) COG turned out to be maintenance of Law and order, so AFP given lead. Economic governance changed over from AusAID lead to Treasury lead

- Liaise, liaise, liaise!
- Investigate more thoroughly.

In conclusion, EBO is definitely being done to a much greater extent than before; however, it is not clear to what extent it is being done in terms of the aspirational concept. What is clear, is that is a good idea to be doing it, however, there is certainly room for improvement.

Davis summarized his presentation with some Australian challenges and directions:

Challenge – Socio-cultural

Australia has little experience with attacks on home soil, nor of major conflict from within

Direction – Research effort towards understanding and modelling socio-cultural influences a) Radicalisation b) Resilience

Challenge – Organisational

Growing & dynamic mix of agencies, with vastly differing levels of experience

Direction – Learn by doing, but greater use of simulated/virtual environments

Challenge – Individual

Increasing demands on the individual – Information warrior, social analyst …

Direction – Human capabilities may change - for the first time in our history

Annex B   Polnicky – Afghanistan

This page intentionally left blank.

Annex C   Hendy – Canada (Toronto)

THE WAY AHEAD FOR THE HUMAN DOMAIN

What might we expect from the Enterprise in the area of future human domain S&T? Following is a short list of expected outcomes:

- The study of adversary intent will improve our abilities for inferring and influencing the goals of opposing actors, providing support to the intelligence community and to decision makers responsible for the resolution of conflict.

- A human view will be brought to the systems and capability engineering paradigms so that our socio-technical systems will be designed to support the goal structures and decision-making requirements of blueforce players.

- Canada will field more robust and better prepared forces, physiologically and psychologically, through advanced readiness programs that include physical fitness, psychological resilience, training and life-long learning programs.

- Decision support systems will be built around a theoretical framework of human decision making and will include enhanced displays that are consistent with developing situation awareness in effects-based operations.

- An understanding of the societal and cultural aspects of collaborative and collective behaviour will allow us to mobilize the full capability of a multiplayer approach to conflict resolution (e.g., JIMP and Whole of Government).

- The personnel and manpower needs of advanced military and security systems will be correctly captured during the acquisition process.

- Advanced protection, integrated with operational personnel equipment ensembles, will enhance capability while improving survivability in hostile settings.

Some areas are relatively mature and are ready to deliver solutions immediately. For example human systems integration is currently finding a place within the systems and capability engineering processes that many nations are adopting. Others, such as adversary intent, are just taking their first steps.

This page intentionally left blank.

Annex D   van Chestein – Canada (Quebec City)

Many reasons for insurgency:

- To defend, protect, redefine land boundaries, territory divisions, political regime, institution architecture

- Resistance to foreign invaders, chasing dictators

- Revolution, rebellion, uprising, insurgence, guerrilla due to civil, ethnic, religious wars; class, party struggles within the same territorial limits (and same name)

- Diverging identities and relationships to the (home)land; there are many examples

- Emergent politics, conflicting discourse, arguments

- Dominant groups: ideology tends to rule, scorn and ignore

- Dominated groups: (re)define their emergent identity

- From enduring submission to claim or resistance

Reviewing the reasons for engaging in battle:

- Deep-seated causes have matured and are often linked to place limits

- The source of one's identity and the process behind the identity of emergent locals

- The various freedoms of choice for those who desperately cannot afford the terms really have no choice at all refuse a fictitious choice as an ultimatum; the 'Heads, I win, Tails, you lose' proposition pursue despite negotiation or improved positions; the 'win or lose, I will appeal' syndrome

Deciphering and representing the conflict situation:

- Bellicose discourse (I protest energetically! (Diplomatic affirmation)

- Place names at stake: Falklands or Malvinas?

- Significance and strength of limits: is the boundary a barrier or a sieve?

- Linguistic, geographic and historical intelligence: when someone sings of forever marking your forehead with the nails of his soles, should you take notice?

Knowledge of terrain and country

- Strategy: socio-economic data, political structure, ethnic and religious divisions and behaviours over the land. The coup d'œil, to which he refers verbatim, means a spatial comprehension of the situation, not necessarily obtained from first-hand observation, but certainly from a study of terrain and country.

- Operations and tactics are linked to topography, hydrography, climate

- The concentration of forces required to engage in battle differs greatly from the dispersion needed to occupy the conquered country. Knowledge of the terrain therefore constitutes an important source of strength, both during and after the battle.

This page intentionally left blank.

Annex E   Susan E. Campbell – Bosnia and Iraq

Planning for Resilience in the Face of Conflict

Study of the human dimension of a past (Bosnian) and a present (Iraqi) war

For presentation April 26, 2007

Understanding the Human Dimension of 21st Century Conflict

Susan E. Campbell, Ph.D., R.N. and K. "Kas" Golubić

Bionova International

bostoncampbell@yahoo.com

Introduction to Conference:

Accepting "collateral" damage has been treated as a necessary consequence of conflict and war. That premise should be challenged. This presentation discusses (Slide 2) how:

1. Aspects of nationalistic conflict, partitioning of Yugoslavia and Bosnia-Herzegovina, and predictive modeling may be applied to Iraq, and how

2. Non-violent collateral effects of war may be reduced in context of any nationalistic conflict through support of public health to improve resilience.

The Balkan war: preamble to 21st century conflicts.

Having followed Bosnian politics and visited Croatia during the Balkan war, we assert that religion may define the groups, but not the reasons they fight. (Slide 3)

In our view, the fighting in Iraq, like that in Yugoslavia and Bosnia-Herzegovina, is about the struggle for social and economic power. In these instances, hostile groups are each defined by their nationalism – more a consequence than a cause of war.

Emerging in response to the perception of being attacked, taken advantage of, or oppressed, nationalism involves gathering for the purpose of aggressive action, in the name of defence. It stimulates feelings of loyalty in adherents and feelings of antipathy in others. It is a polarizing force.

The type of nationalism expressed (Slide 4) depends on history, economics, race/ethnicity, religion, culture, and location. Reflecting the sense of oppression (whether real or imagined) that spawned it, nationalism has potential to propagate fear of victimization even, paradoxically, while victimizing others.

In cases of disproportionate power, the potential for guerilla warfare by the less powerful group increases. Situations of this kind make it hard for external powers to help defuse the conflict, separate warring factions, negotiate ceasefires, or broker accords. For those who would intervene, the unpredictability of guerilla tactics means the expense of security rises and the time frame of the intervention is also harder to predict.

The economics of warfare are changing along with the nature of conflict. There is a growing awareness that the concept of "collateral damage," which encompasses impact on civilian populations, can no longer be accepted as unpredictable or unmanageable. In part, this stems from the sense that any group that comes to "help" can be viewed as "saviour" by one side and "interloper" or "occupier" by the other. The presence of a third party in armed conflict also increases the complexity of the situation and the costs of resolution.

Until now, the demographically predictable number of civilians experiencing loss of domicile and contributing to the swell of displaced persons and refugees has not been part of the math of war planning - shifting costs to relief agencies and neighbouring countries.

Examining the situation of Bosnia-Herzegovina with comparisons to Iraq indicates that there is potential for greater predictability of outcome if an analytical demographic approach precedes an intervention (Slide 5).

We will examine how predictive modeling worked on the example of Bosnia-Herzegovina, and how it could work in Iraq, concluding with a discussion of how planning for mitigation of non-violent collateral effects by supporting public health could improve resilience of the affected communities.

Iraq

To understand the current situation in Iraq, we have to understand the history: the British and French carved up the Middle East in 1916 with the Sykes-Picot Agreement, forming the generalized borders of what was to become Iraq out of Mesopotamia. By most calculations, oil was discovered in Iraq only during the early-to-mid 1920s. Thus, it is important to remember is that the borders were drawn before oil was part of the equation.

From the establishment of the Iraqi borders, through incarnations of the Hashemite monarchy, various interim dictators, and the establishment of the Ba'ath Party, Iraq was consistently under Sunni Muslim/Arab rulers. It didn't matter that the oil was only to be found in Kurdish and Shia regions, since the Sunni controlled all of it. In the meantime, the Iraqi economy became a petroleum-based one.

Comparisons of Yugoslavia, Bosnia, and Iraq

Analyzing wars based on nationalism requires examination of the factors that give rise to it. This is the basis on which comparisons can be drawn. Let's examine what we know from study of Yugoslavia and Bosnia. Over time, cultural and religious practices of occupying powers such as the Byzantines, Ottomans, Venetians, Austro-Hungarians, and Nazi Germans, left imprints on the Balkans. Religious affiliation has become synonymous with nationality (Slide 6) in the former Yugoslav republics (Catholic Croats and Slovenes; Orthodox Serbs, Montenegrins, and Macedonians; Muslim Bosniaks and Albanians). Despite these numerous religious distinctions, the breakup of Yugoslavia was due to economic reasons. In 1991, Slovenia and Croatia, the number one and number two industrial and tourism- based economic engines of Yugoslavia seceded. Bosnia-Herzegovina voted to secede from Yugoslavia on April 6, 1992.

Bosnia-Herzegovina split along cultural lines when faced with the possibility of being annexed to Serbia. The death of Yugoslavian leader Marshall Tito left a power vacuum (Slide 7) that was quickly occupied by the Serbs. Serbians held dominant positions of legal and *de facto* control. The Serbs retained full control of the Yugoslav army during the cessation by Slovenia and Croatia. With these departures, the Yugoslav army became Serbian, with control transferred to Bosnian Serb leader Radovan Karadzic. Serbian military personnel were subsequently responsible for most of the ethnic cleansing.

A single-source economy (oil) and political circumstances of geography are the reason for nationalistic conflict in Iraq. Slide 8 shows how the major religions are distributed in the region. Arrows point to Bosnia-Herzegovina and Iraq. In Iraq, Shia form the majority.

By training and supporting the new Iraqi military in which former (Sunni) Baathists were denied participation, coalition forces shifted power to the Kurds and Shia. In the power shift, the Sunnis, which included the most educated professionals with the highest standard of living, were left impoverished along with everyone else. It made sense that the Kurds and the more numerous Shia would take advantage of participation in a new coalition government due to the geographic distribution of the groups and the positions of oil reserves relative to them. The lack of Sunni participation was triggered by the context of the war. Removed from power and influence as well as deprived of means, Sunnis, now a disenfranchised minority launched an insurgency – initially directed against the US. It evolved into civil war against the Shia.

The importance of Slide 9 is to show that Kurds (orange on the map) occupy the northern oil producing area, and Shia (green), the southern ones. Sunni (yellow) are in between, and the major population of Baghdad. Areas of overlap are striped. The Sunnis, representing only 17% of the present population, have held power in Iraq for centuries.

Predictably, the overwhelming majority (98.5%) of the Iraqi Kurdish population voted for independence from Iraq in a referendum last year. Functionally independent, their biggest concern is whether they will retain lasting control of Kirkuk, center of oil production in the north. Striped green & yellow regions show areas of significant mixing of Sunnis and Shia.

Whether overlapping populations of Sunni and Shia Arabs can be split into culturally pure Sunni and Shia enclaves; whether there is any chance of protecting Iraqi areas that profess and adhere to a cosmopolitan existence like the culturally mixed population of Sarajevo that withstood a two year siege by rural Serbs remains to be seen. Trying to create a Sunni-controlled region would be a challenge even with their good will. A Shia dominated region encompassing all but Kurdistan is the defacto situation, irrespective of local Shia factions pushing for smaller regional governance. The new Iraqi constitution stipulates that Baghdad city may not join any other region, but may become a region of its own (Galbraith, 2006) – a solution suggested for Sarajevo by Vance and Owen that did not materialize. Dividing cities with intermingled sectarian populations is nearly impossible, so a unified governance or winner-take-all were the only actual options in Iraq.

The new Iraqi constitution provides for fair distribution of revenues from existing oil wells to all three major constituencies according to Galbraith. That the product of future exploration will accrue to the regional governments appears to be an unappealing arrangement for Sunnis despite the possibility that Baghdad may sit atop a major oil reserve.

Galbraith points out that under the constitution, Sunnis (who refused to participate in its writing) have the same rights as Kurds and Shiites, and "that is a remarkable – and even magnanimous- result considering Iraq's history." He concludes, "In Yugoslavia in the spring of 1991, the United States and Europe put all their diplomatic energy into a doomed effort to keep the country together when they should have focused on preventing the war that followed. Two hundred thousand people died in a war that might have been prevented with more realistic policies." We believe the same thing occurred in Iraq.

The predictive power of demographic analysis

Study of the pluralistic problem of Bosnia illustrates the point that even wars of nationalism yield to predictive analysis (Slide 10). The 1992 Vance and Owen peace proposal for Bosnia (Golubić et. al 1993) involved the concept of partitioning by majority rule, while ignoring the issue of "ethnic (cultural) cleansing." The resulting "Realpolitik" of "hands-off" peacekeeping by the UN perpetuated power imbalances among the three cultural factions because it's arms embargo prevented the Herzegovina Croats and Bosniaks from getting arms necessary for their defence that Serbs already possessed. Bosniaks experienced the most impact from the embargo.

What the negotiators did not appreciate is the problem of plurality. The pre-eminent partitioning effort, the Vance-Owen map, failed to account for situations in which the combined Bosniak and Croat minorities *exceeded* the size of the nominally dominant Serbs who merely held plurality, not majority. Using the 1991 (pre-war) population census, we pointed out the plurality problem and predicted 1.6 million refugees if ethnic cleansing proceeded in Serb-controlled areas outlined by the Vance-Owen partition plan (Golubić et al., 1993 p. 221).

Let's examine the analytical predictive model for Bosnia in more detail to appreciate principles that can be applied to other settings like Iraq:

Our Slide 11 shows numbered pre-war districts (counties) for the 1991 pre-war census of Bosnia-Herzegovina. Other former republics of Yugoslavia surround it: Croatia lies to the west and north, Serbia to the east and Montenegro to the south. Sarajevo the capital is indicated by the black dot.

Slide 12 introduces color-coding for the maps that follow. Bosniak Muslims are green, Serbs are red, and Croats are shown in blue.

Slide 13 shows our evaluation of the demography. Areas with a simple majority of one of the three major cultures are shown in dark colors. Counties in which a cultural group merely outnumbered the minority groups (a "plurality") are shown in light colors. One clearly sees that Bosniaks are mostly found in the eastern half (green) next to Serbia, Croats predominate in the border regions along the northern and southwestern borders (blue) with Croatia. Serb areas of dominance are red.

Slide 14 shows the 1992 Vance-Owen peace proposal. It reflects Sarajevo's multinationality (white area), inexplicably increases the size of Croat and Serb areas, and diminishes the Bosniak dominated region.

"Ethnic cleansing" followed by the Dayton accords of December 14, 1995 combined with the shift of world opinion against the Serbs following the Srebrenica massacre, resulted in the new border (black line) seen in Slide 15. Most of the dead and displaced were Bosniaks, who had never had the means for self-defence and were not defended by others until the very end.

Slide 16 was posted by Bosniaks on Wikipedia. It gives their view of the "before" and "after." The deepening of colors reflects the increased concentration of single cultures making even more apparent the extent to which ethnic cleansing occurred.

Slide 17 shows the new map of the Bosnia-Herzegovina Confederation.

The 3-Canton model we described in 1993 using the pre-war population census illustrates in Slide 18 the magnitude of minorities in each of the culturally defined areas. Using these percentages, the numbers of displaced populations were predictable when ethnic cleansing occurred.

Percentages and numbers of displaced people are shown in Slide 19. In the Bosniak section, 43.5% are non-Bosniak, totaling 1.2 million people. In the Serb section, 38% were non-Serbs, totaling 416,000. Non-Croats made up 34% of the Croat section – 164,000. Serbs took over several highly populated counties previously dominated by other groups, particularly in Eastern Bosnia, including Srebrenica. This ethnic cleansing of non-Serb populations of Eastern Bosnia circled in red in Slide 20 resulted in an additional 253,000 minority population losses (encompassing the displaced and dead.) Slide 21 shows that adding this 253,000 to the 1.8 million based on the original 1991 census map – the total driven from their homes based on predictive methods is very close to the 2 million actually displaced (Amnesty International Press release of 01-26-2006). UNHCR gives a 2.2 million figure (June, 2006) - Slide22.

Conclusions based on study of Bosnia and Yugoslavia

Interventions by world powers should be based on thorough understanding of the problem before taking action. We recommend (Slide 23) that they:

> • Obtain a pre-war population census.

> • Produce a demographic map to enable population analysis (such a map is still lacking for Iraq).

> • Identify victimizers and victims, and defend the defenceless.

Mitigating the effects of wars that involve nationalism means finding ways to reduce civilian losses from guerilla warfare while creating a basis for restoration of order. We suggest that war planning include ways to:

> • Mitigate disaster through initial and periodic forecasting of potential and actual damage to populations through displacement and other impacts.

> • Perform best- and worst-case planning for public health supports to keep people from becoming refugees.

> • Offer help designed to improve resilience of civilians' health by supporting the existing public health infrastructure.

Reducing the humanitarian impact of cultural conflicts of the 21st century by promoting resilience:

Civilian populations experience war in direct and indirect ways. Burnham et al (2006) calculated violent and non-violent effects to civilians in Iraq. These and other studies (WHO, 2005) demonstrate the predictive potential of public health surveillance. They lead to the conclusion that many non-violent collateral effects of war could be prevented (Slide 24) by focusing attention on public health as part of war planning in the observer community. We think that strategies for prevention of deteriorating health conditions, the spread of infectious disease, and collapse of the health infrastructure that are all predictable non-violent collateral effects of war should be included in war planning.

As soon as the potential breakdown of civil structure is recognized, stepping up public health education may be the most effective approach to enhancing resilience. According to WHO (2006) little public health education has occurred in Iraq.

Mothers are the health providers of first and last resort to their families when systems fail. Because any help they can get in time of war will help everyone, women should be a main focus of public health education efforts. Women resourcefully meet the needs of their families using whatever useful local materials they can find. The best pediatricians everywhere recognize mothers as their eyes and ears. Their natural skills of observation can be enhanced and redirected through instruction in family health care that includes simple reading and math. (Female literacy is currently 66% in Iraq.)

Providing problem-focused, picture-based and simply-written educational materials via women's groups could help them cope with lost access to the healthcare system when conflict escalates - without threatening cultural power structures. For example, the consequences of acute diarrheal diseases, the number one cause of infant and toddler morbidity and mortality in wartime, could be prevented or significantly reduced by instructing mothers to use boiled water. They could be taught how to prepare and use sugar/salt solutions ("oral rehydration salts") to treat dehydration, and when to use them. Basic hygienic habits such as hand washing before preparing food, eating, and treating wounds also reduce transmission of communicable pathogens, but are normally overlooked as a priority under substandard conditions of war.

The effort should include combating malnutrition, the number 3 cause of illness in children under five, by providing and distributing vitamins. Stepping up vaccination against measles, mumps, whooping cough, diphtheria, and typhoid (all cited as major cause of childhood morbidity in Iraq) before conflict expands to new areas could prevent much collateral impact of war on children.

 For people over five years of age the same chronic diseases that cause morbidity and mortality in peacetime escalate in impact. Hypertension is the lead cause of morbidity in adults. When the stresses of war and reduced access to medications combine, heart attacks and strokes increase, causing the majority of non-violent "collateral" deaths. Infections resulting from wounds and respiratory diseases -such as pneumonia, TB, and asthma –increase dramatically.

We assert that any external intervention, be that a military or police action, peace-making or peace-keeping, bears the responsibility to complement or replace the local health infrastructure.

This needs to be a part of the advance war planning (Slide 25). Steps needed to reduce collateral impact of war include providing:

- Security, to keep public health professionals and clinicians on the job and protect existing infrastructure, especially supply chain and distribution points where people can obtain chronic disease medications they have already been taking as well as those needed to treat new wounds and illnesses.

- Money (to pay salaries of public health professionals).

- Certain medication stockpiles to enable treatment of acute disease and prevent exacerbation of chronic illness.

- Practical education for women to improve their ability to cope with disaster.

If we can ascertain how populations are distributed, predict public health needs and proactively plan for them, more noncombatants will survive conflicts. Devising approaches that are more effective for their needs, more efficient for military planners of world powers, and less costly to all from humanitarian and monetary perspectives will contribute to resilience.

Conclusion

In summary (Slide 26), by analyzing pre-war population distribution in the context of country-specific information about their ethnic/cultural/religious make-up, the geography and economy, and the prevailing age-structure and health status:

- The number and sources of potential refugees and their morbidity are predictable and may be reduced.

- Excess illness and death of civilians caused by "collateral" nonviolent effects is predictable and, to some extent, preventable.

- Mitigation is attainable using simple low-cost public health interventions and by redirecting some of the security resources to protect public health infrastructure.

Thanks

Thanks (Slide 27) are due to Stjepko Golubić, Ph.D. for insightful critique, maps, and editing, to Alfred DeMaria, M.D. for his review of public health section recommendations, and to Brian Daley for editorial refinements.

References

Amnesty International Press release 01-26-2006 Bosnia and Herzegovina: widespread discrimination blocking refugee return. http://web.amnesty.org/library/index/engeur630012006

Briefing NoteUNHCR and Displaced Persons in Bosnia and Herzegovina Protection Unit UNHCR Sarajevo, BiH, 4pp, June 2006 http://www.unhcr.ba/protection/DPsbackgroundnote.pdf

Burnham, G. Lafta, R., Docey, S. and Roberts, L. , Mortality after the 2003 invasion of Iraq: a cross-sectional cluster sample survey, Lancet 368 (2006), pp 1421-1428.

Christian Science Monitor Report. Dec 6, 1995. Mass Graves and Other Atrocities in Bosnia. http://www.fas.org/irp/congress/1995_hr/c951206r.htm

Galbraith, P., 2006. "The End of Iraq." Simon and Schuster, New York, London, Toronto, Sydney, pp 260.

Golubić, S., S.E. Campbell, and Golubić, T. 1992. "How Not to Divide the Indivisible" in "Why Bosnia? Writings on the Balkan War" Eds: R. Ali & L. Lifschultz, Pamphleteer's Press, 1993, pp.209-240. A demographic analysis & conclusion opposing the Vance-Owen proposal to partition Bosnia - recommendations for governance to attain peace.

Health in Iraq, Ala'din Alwam, Minister of Health, December 2004; ICMMS (1999) UNICEF, reprinted in Iraq HSP WORKING DOC 11 May05 edited June 12.

"Illnesses in Iraqi Children 2004, under and over age 5" Table.

Health in Iraq, Ala'din Alwam, Minister of Health, December 2004; ICMMS (1999) UNICEF, reprinted in Iraq HSP WORKING DOC 11 May05 edited June 12.

"Iraq and Its Peoples" map http://www.kurdistanica.com/english/geography/maps/map-07.html

Iraq Health Sector Profile May 2005
http://www.who.int/hac/techguidance/tools/disrupted_sectors/module_13/en/index6.html

Map of Bosnia-Herzegovina http://www.lib.utexas.edu/maps/cia03/bosnia_herzegovina_sm03.gif

Map of Sunni and Shia distribution
http://www.lib.utexas.edu/maps/historical/history_middle_east.html

 "Mortality Morbidity Ages 5 and Over, Iraq 2004" Table.

Health in Iraq, Ala'din Alwam, Minister of Health, December 2004; ICMMS (1999) UNICEF, reprinted in Iraq HSP WORKING DOC 11 May05 edited June 12.

Oral Rehydration Solution Recipe http://rehydrate.org/solutions/homemade.htm

World Health Organization

Eastern Mediterranean Regional Office (EMRO)

Division of Health System and Services Development (DHS),

Health Policy and Planning Unit,

Health Systems Profile Country: IRAQ

Date: June 2005 pp61 http://www.emro.who.int/Iraq/pdf/HealthSystemsProfile.pdf

Annex F   Verdon – Panellist

New Paradigms

Of one cloth – interrelated, inter-woven:

Complexity – emergence

One World – climate change & the global village and whole of government

Rupert Smith's – War among people and the utility of force

New Concepts

Emergence – the whole becomes greater than the sum of its parts

> • Turbulence and Self-organization

> • Identifying and stabilizing patterns

> • Emergent's reflexive role in the adaptive/evolving system

War-Among-People – Long-terms Confrontations & dynamic conflict

> • Political Strategy is primacy – political goals that force can achieve

> • Context intelligence - Adversarial and non – reaction to action (winning hearts and minds) – social-cognitive framing

> • Not only fighting the terrorist – but the consequences of its use

Yanner Bar-Yam's *Complexity Profile*

> • Complex Evolving Systems (evolving identity)

Network-Enable Capability – Peer-production and trusted situational awareness

> • Distributed control – beyond the leader/decider

> • Network Individualism: Who am I? Who are We? Close versus Loose ties

<u>Note on New Concepts:</u>

Political Strategy is primary to determine, what force, how it is used, when, to achieve or support what end? The utility of force. Winning military values does not solve anything. Political strategy of when, how and how much force. Political Strategy is vital to Integrated Rapid Response and Integrated Security Solutions. Vital for 'common intent' and determining the narrative of our intervention – what story are we telling that credibly makes sense of actions in line with our intentions. How we use force can with 'their' hearts and minds but also 'our' hearts and minds. The Moral dimension. In war-among-people the CNN factor and global reach makes among 'us' as well. Expansion of the definition of 'Behavioural Effects' **Yanner Bar-Yam's – Complexity Profile.** Matching internal complexity with the environmental complexity and changing fitness landscape. We must design our organizations not just as 'complex adaptive systems' but to be complex evolving systems – to match the evolving fitness landscape. Network Technologies and Peer-production new ways to design how organizations and people achieve

their ends. Network Enabled Capability … must change structure. Networked technologies - Social networking applications (e.g. Facebook, MySpace and Wikipedia).

New Capabilities

Augmented Collaboration

Augmented Cognition

Peer-Production - Virtual division of labour and more productive human capital

- Organizational context

- Strategic Integration of Personnel System

- Generation of Personnel

- Support to Personnel

- Alignment with Society

<u>Note on New Capabilities:</u>

> The key for the military is that we have to also transform HR from its industrial model - how we see people as the shaping of a cog (tasks-based job/occupation) to fit into a larger machine. We have to understand that people represent knowledge and learning capabilities and that to harvest the investment we must make in professional development we must account for the whole person all of the abilities. Accelerating science and technological progress requires life-long learning, longer healthy productive life must lead to the consideration of flexible terms of service where people can join/leave at different "life cycles".

Contexts require different levels of adaptation and cognitive shifts – to recognize contexts and changing contexts. As well there are 'boundary' issues in crossing from one context to another.

- Technological level – the information systems in use and the corresponding technical standards and protocols necessary for interaction

- Organizational level – its organizational design(s) that enable, inhibit and adapt networks

- Doctrinal level – the collaborative concepts, strategies and tactics

- Social level – the personal ties that assure loyalty and trust

- Narrative level – the story being told, through frames, narrative structure and value frameworks

Traditionally – the military technological framework tended to be the longest planning horizon – future fleet size, platforms, types of technologies, capabilities, etc.

With the pace of scientific and technological progress the technological framework is challenged to transform more rapidly – obsolete equipment becomes a larger issue. Planning is more challenging even if the horizon is no longer as far away.

However, people now become the farthest horizon, (especially when one thinks of 'the 100 year life'), even with a later retirement age, people will continue to seek some manner of engagement. In addition to our primary mission, the military is by necessity a pre-eminent developer of human capital and in pursuit of this requirement, people concerns constitute 60% of our budget and seems to be increasing. By understanding the contribution of our people when they leave, we can understand a 'return on investment' and can leverage this for more funds.

This page intentionally left blank.

List of symbols/abbreviations/acronyms/initialisms

DND	Department of National Defence
DRDC	Defence Research & Development Canada
OPI	Office of Primary Interest
R&D	Research & Development
S&T	Science and Technology
JIMP	Joint, Interagency, Multinational and Public
CORA	Centre for Operational Research and Analysis
CDS	Chief of Defence Staff
PRT	Provincial Reconstruction Team
3-D	Defence, Diplomacy and Development (now Whole of Government)
CFD	Chief Force Development
NCW	Net Centric Warfare
C2	Command and Control
ADF	Australian Defence Force
PM&C	Prime Minister and Cabinet
PSCC	Protective Security Coordination Centre
HFD	Human Factors Division
MoD	Ministry of Defence
NRC	National Research Council
HR	Human Resources

This page intentionally left blank.

Distribution list

Document No.: DRDC Corporate TR 2007-004

LIST PART 1: Internal Distribution by Centre

0   TOTAL LIST PART 1

LIST PART 2: External Distribution by DRDKIM
1   Library and Archives Canada

1   TOTAL LIST PART 2

1   TOTAL COPIES REQUIRED

This page intentionally left blank.

1a. PERFORMING AGENCY	2. SECURITY CLASSIFICATION
Defence R&D Canada	Unclassified/Unlimited

1b. PUBLISHING AGENCY	
Defence R&D Canada	

3. TITLE

Colloque S&T Symposium 2007 - Understanding The Human Dimension in 21st Century Conflict/Warfare - Comprendre la dimension humaine du conflit et de la conduite de la guerre au XXIe siècle

4. AUTHORS

Robert N. Webb; Head of International S&T and Technology Outlook Strategy

5. DATE OF PUBLICATION	6. NO. OF PAGES
August 2007	65

7. DESCRIPTIVE NOTES

Discussions from Defence R&D Canada Science and Technology Symposium 2007. "Understanding the Human Dimension in 21st Century Conflict/Warfare: Setting the Stage with the Future Security Environment" held April 25-26, 2007, Crowne Plaza Hotel, Ottawa, Canada.

8. SPONSORING/MONITORING/CONTRACTING/TASKING AGENCY

Sponsoring Agency: Defence R&D Canada

9. ORIGINATORS DOCUMENT NO.	10. CONTRACT GRANT AND/OR PROJECT NO.	11. OTHER DOCUMENT NOS.
DRDC-TR2007-004		DRDKIM System Number: 528008 DRDKIM Accession NUmber: CA029657

12. DOCUMENT RELEASABILITY

Unlimited distribution

13. DOCUMENT ANNOUNCEMENT

Unlimited Announcement

14. ABSTRACT

A record-high audience of over 200 participants took part in the 2007 S&T Symposium, held 25 & 26 April in Ottawa. This was the seventh in the series of DRDC symposia, which has now become a DND symposium with the cosponsoring between DRDC and CFD. The opening remarks by the Symposium Moderator detailed the past six symposia and noted that these had not covered the area of social science. He noted that the theme of this seventh symposium "Understanding the Human Dimension in 21st Century Conflict/Warfare" set the stage for studying this area of science at this and the next two or three annual symposia.

15. KEYWORDS, DESCRIPTORS or IDENTIFIERS

Human Dimension, Future Security Environment, Security, Conflict, Person, Nature, Self, Social Instability, Disaster, Bosnia, Iraq, Afghanistan, Lessons Learned

Defence R&D Canada

Canada's leader in defence
and national security R&D

R & D pour la défense Canada

Chef de file au Canada en R & D
pour la défense et la sécurité nationale

DEFENCE R&D DÉFENSE

www.drdc-rddc.gc.ca